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Relationships between adult attachment style ratings and sleep disturbances in a nationally representative sample

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ABSTRACT

Objective: Recent research with small non-clinical and clinical samples suggests a positive association between attachment insecurity and sleep disturbances. The present study extends this line of research by exploring this relationship in a large sample of the U.S. population and by statistically adjusting for health conditions and psychiatric disorders as potential confounds.

Method: The data used were from the National Comorbidity Survey Replication ($N = 5692$). The main interview consisted of the *Composite International Diagnostic Interview* used to assess psychiatric diagnoses. Ratings of three adult attachment styles (viz., secure, avoidant, and anxious) were obtained along with self-reports of health conditions and four sleep disturbances (viz., difficulty initiating sleep, difficulty maintaining sleep, early morning awakening, and daytime sleepiness).

Results: Bivariate logistic regression analyses indicated that ratings of secure attachment were negatively associated with each sleep disturbance and ratings of insecure attachment were positively associated with each sleep disturbance. Multivariate logistic regression analyses were used to examine associations between the attachment ratings and sleep disturbances while statistically controlling for sociodemographic variables, the presence of a health condition, and psychiatric disorders (viz., depressive disorders, bipolar disorders, anxiety disorders, alcohol/substance disorders, and attention deficit disorder). With one exception, the insecure attachment ratings continued to be positively associated with sleep disturbances.

Conclusion: The findings demonstrate that attachment insecurity is related to sleep disturbances independent of health conditions and concurrent psychiatric disorders. Research aimed at delineating the mechanisms responsible for these associations is warranted.

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Introduction

Sleep difficulties are associated with serious negative consequences, such as metabolic and endocrine dysfunction [1], cognitive impairments [2], and reduced occupational functioning [3]. Health conditions and psychiatric disorders are well-established correlates of sleep disturbances [4]. However, the links between sleep disturbances and these conditions are more complicated as sleep difficulties are thought to be both a common consequence of many health and psychiatric conditions [5,6] and to also play a role in the development of such conditions [5,7,8]. Furthermore, the presence of a sleep disturbance is a central feature (i.e., a symptom) of some psychiatric disorders (e.g., depression).

Efforts to improve prevention and treatment strategies for sleep difficulties could be enhanced by the identification of individual difference variables related to sleep disturbances. Attachment insecurity has

attracted attention as a potential risk factor for sleep disturbances [9]. In brief, attachment theory posits that individuals develop enduring cognitive schemas, or working models, based on their early experiences with attachment figures, such as a parent or a caregiver [10–13]. While individual characteristics are shaped during infancy, they continue to guide behavior and expectations in interpersonal relationships throughout life, showing a relative degree of stability while also incorporating temporary or long lasting changes depending on one's life context and new attachment relevant experiences [14,15].

A large body of research on adult attachment has been based on the notion that individuals can identify themselves as fitting into one of several attachment styles. Related to this, some measures ask respondents to rate themselves in terms of their level of correspondence to specific attachment styles. Secure attachment involves positive views of self and others. Individuals with this style are comfortable with both intimacy and independence. Secure attachment promotes healthy behaviors such as seeking support and comforting response to interpersonal challenges and distress [14]. The two basic insecure attachment styles, anxious and avoidant attachment, are associated with less adaptive behaviors such as isolating oneself, choosing compulsive

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self-reliance over reliance on others (i.e. insecure–avoidant style) or demanding excessive reassurance and fearing attachment loss (i.e. insecure–anxious style) [14]. A large body of research suggests that attachment insecurity is associated with negative outcomes such as relationship distress [16], psychopathology [17], somatic symptoms [18], and physical health conditions [19].

As noted earlier, there has been a growing interest in the connection between attachment and sleep [9]. One line of research has focused on infants and children. It is based on the idea that attachment characteristics and sleep quality are related because sleep–wake regulation and the attachment system both develop during infancy and both are highly influenced by interactions with caregivers. The sensitivity of both attachment and sleep to the nurturing practices of caregivers, as well as their direct interaction, have been subject to several cross-sectional and longitudinal studies spanning infancy and early childhood. For instance, biological evidence of their connection in early life has been provided by both animal studies, which have shown changes in sleep physiology during mother–infant separation [20,21], as well as human studies, which have shown increased sleep regulation in close contact mother–newborn rearing practices [22,23]. Furthermore, the relationship between attachment and sleep has also been supported by several studies suggestive of bidirectional relationships between attachment to parents, emotional security, and children's sleep [9].

Research focused on adult attachment and sleep has primarily been based on the idea that attachment insecurity involves a heightened sense of threat and increased vigilance that interfere with sleep. To date, nine studies with adult samples have examined relationships between attachment variables and subjective reports of sleep impairments or disturbances. Of these, six utilized non-clinical samples, such as female health workers [24], university students [25], both members of romantic/cohabitating couples [26,27], and small community samples of healthy adults [28] and older adults [29]. Three studies examined clinical populations, including women with recurrent major depression [30], military veterans with posttraumatic stress disorder symptoms and sleep disturbances [31], and breast cancer survivors [32]. In general, these studies found support for an association between attachment insecurity and poorer self-reported sleep quality [24–26,28,29,32]. Approximately equal numbers of studies have found attachment avoidance [24,26,28,29,32] and attachment anxiety [24–26,32] to be related to self-reported sleep problems, with three obtaining significant findings regarding both forms of insecurity [24,26,32]. There have also been several null findings [27,30,31]. However, it is important to note that these studies found attachment insecurity to be associated with reduced sleep quality as assessed by polysomnographic sleep measures [30,31] and with increased sleep difficulties during separations from romantic partners [27].

In the current study, data from the National Comorbidity Survey Replication (NCS-R) [33] were used to address two limitations of past research investigating associations between adult attachment and sleep disturbances. First, previous studies have primarily utilized small samples of university students, other unique samples (e.g., female health workers), and clinical samples, and as a result the generalizability of the findings of these studies is uncertain. The NCS-R involved a large sample representative of the general U.S. civilian population. As such, findings based on it are highly generalizable. Second, previous studies did not account for health conditions and psychiatric disorders as possible confounds. Health conditions and psychiatric disorders are both well-established correlates of sleep disturbances [4], and are both positively associated with attachment insecurity [17,19]. Given this situation, it is necessary to demonstrate that relationships between attachment and sleep variables are not simply the result of their shared variance with poor health and psychological distress. To address this issue, two studies have demonstrated that associations between attachment insecurity and self-reports of sleep disturbances remain after adjusting for depressive symptoms [26,29]. It is important to note that these studies did not adjust for health conditions and included only

one form of psychopathology (viz., depression) assessed with self-report measures. The current study provided a more comprehensive evaluation of the impact of potential confounds by statistically adjusting for health conditions and a wide range of psychiatric disorders. Given past studies have found that relationships between attachment and sleep variables are not the result of their shared variance with depressive symptoms, it was hypothesized that attachment insecurity would be positively associated with each form of sleep disturbance even after controlling for relevant comorbidity.

Methods

Participants and procedures

The NCS-R public use data set was utilized. The NCS-R involved a probability sample of the United States non-institutionalized civilian population, aged 18 or older, and had a response rate of 70.9%. Administration of the interview was in two parts. Part I consisted primarily of a diagnostic assessment of psychiatric disorders, and was administered to the entire sample ($N = 9282$). Part II was administered to all the respondents who reported a lifetime disorder in Part I and to a probability subsample of the others ($N = 5692$). Weighting procedures were developed to adjust for differential probabilities of selection and non-response, and to adjust the sample to reflect the U.S. population's demographics (i.e., sex, race, marital status, education, living arrangements, region, and urbanicity). The variables of primary interest in the present study (i.e., attachment and sleep disturbances) were included in the Part II interview, so the weighted Part II data were utilized. Basic demographic information regarding the sample is presented in Table 1. Ethical approval for the primary data collection of the NCS-R was provided by the Human Subjects Committees of Harvard Medical School and the University of Michigan. Further details of the NCS-R methodology are presented by Kessler and colleagues [33]. The interview materials are available at <http://www.hcp.med.harvard.edu/ncs/replication.php>.

Measures

Demographic variables

Participants provided information regarding their demographic characteristics. This information was used to calculate odds ratios that adjusted for gender, marital/relationship status (married or

Table 1
Descriptive statistics regarding sample demographic characteristics and study variables.

Variables	Mean	Prevalence	95% Confidence interval
Demographic			
Age	45.01		44.10–45.92
Female gender		53.05%	51.01–55.09
Married or cohabitating		55.94%	53.45–58.4
Caucasian race		72.75%	69.09–76.42
Health condition and psychiatric disorders			
Health condition (1 or more)		77.57%	75.65–79.43
Depressive disorders		7.51%	6.82–8.20
Bipolar disorders		2.88%	2.44–3.32
Anxiety disorders		18.21%	16.90–19.52
Alcohol/substance use disorders		8.51%	7.54–9.49
Attention deficit disorder		2.22%	1.85–2.59
Attachment			
Secure attachment ratings	2.90		2.86–2.93
Anxious attachment ratings	1.31		1.28–1.33
Avoidant attachment rating	1.77		1.74–1.81
Sleep disturbances			
Difficulty initiating sleep		16.42%	15.16–17.71
Difficulty maintaining sleep		19.88%	18.28–21.47
Early morning awakenings		16.66%	15.22–18.10
Daytime sleepiness		16.22%	14.91–17.52

cohabitating vs. never married, divorced, separated, or widowed), race (Caucasian, Hispanic, Black, or Other), age (18–29, 30–44, 45–59, or 60 and above), and education level (0–11 years, 12 years, 13–15 years, 16+ years).

Health conditions

Lifetime experiences with 15 conditions were measured using a yes/no format. Seven questions assessed lifetime histories of arthritis, chronic back or neck problems, frequent or severe headaches, other forms of chronic pain, seasonal allergies, stroke, and heart attack. Eight questions asked participants whether they had ever been told by their doctor that they had heart disease, heart disease, high blood pressure, asthma, chronic lung disease, diabetes or high blood sugar, ulcers, epilepsy or seizures, and cancer. The current study utilized composite variable representing the presence of one or more of these conditions.

Psychiatric disorders

DSM-IV [34] disorders were assessed with the *World Health Organization Composite International Diagnostic Interview (CIDI)* [35]. The CIDI is a fully structured lay-administered diagnostic interview. The current study utilized five composite variables representing past-year histories of depressive disorders (major depressive disorder and dysthymia), bipolar disorders (bipolar I, bipolar II, and bipolar subthreshold disorder), anxiety disorders (generalized anxiety disorder, panic disorder, agoraphobia, social phobia, simple phobia, and posttraumatic stress disorder), alcohol/substance use disorders (alcohol abuse or dependence, substance abuse or dependence, and nicotine dependence), and attention deficit disorder. A clinical reappraisal study [36] found good concordance between CIDI diagnoses and the research non-patient version of the *Structured Clinical Interview for DSM-IV* [37].

Attachment style ratings

Adult attachment was assessed using Hazan and Shaver's [38] attachment style measure administered in an interview format. It includes brief statements describing adult versions of the three attachment styles (secure, avoidant, and anxious) originally identified in children [12]. Similar to Shaver and Brennan's [39] modification of this measure, each respondent provided a self-rating on each of these using a 4-point scale. This measure has been shown to be reliable and valid [40].

Sleep disturbances

Sleep disturbances were assessed with four initial yes/no questions about common sleep problems, as well as several follow-up questions regarding sleepiness. Participants were asked to identify problems that had "lasted for two weeks or longer in the past 12 months." The sleep disturbances assessed were difficulty initiating sleep ("...nearly every night it took you two hours or longer before you could fall asleep?"), difficulty maintaining sleep ("...you woke up nearly every night and took an hour or more to get back to sleep?"), early morning awakening ("...you woke up nearly every morning at least two hours earlier than you wanted to?"), and daytime sleepiness ("...problems feeling sleepy during the day?"). Those indicating the presence of one of these disturbances were asked a series of follow-up questions about their sleep over the past year.

The initial three sleep questions reflect severe sleep disturbances and were therefore used to create dichotomous variables indicating the presence of three specific sleep disturbances. The fourth question regarding daytime sleepiness was less specific regarding the nature and severity of the disturbance. Therefore, three follow-up questions were used to create a variable reflecting the presence of this sleep disturbance. These questions concerned falling asleep while watching TV or listening to the radio or reading, getting drowsy within 10 min of sitting still, and dozing off while relaxing. They were answered with a scale with the options of "often," "sometimes," "rarely," and "never." Respondents were categorized as having daytime sleepiness if they

endorsed the fourth initial sleep question, and responded with "often" to at least one of the four follow-up daytime sleepiness questions.

Statistical analyses

Descriptive statistics (i.e., means and prevalence rates) were calculated regarding the most important study variables including select demographic variables, the health condition variable, the psychiatric disorder variables, attachment ratings, and the sleep disturbance variables. Associations between the attachment ratings were investigated with correlation coefficients. Associations between the dichotomous sleep disturbance variables were investigated with phi correlation coefficients. Associations between the attachment ratings and the health condition variable and the psychiatric disorders variables were investigated with bivariate logistic regression analyses. The primary analyses consisted of two sets of logistic regression analyses. In both cases, the sleep disturbance variables were treated as the dependent variables. The first set of analyses investigated the bivariate associations between the attachment ratings and the sleep disturbance variables. The second set of analyses was similar, but also adjusted for (i.e., included as independent variables) demographic variables, the health condition variable, and the psychiatric disorder variables. In this set of analyses, the three attachment ratings were entered simultaneously in each analysis.

All analyses were conducted using STATA (StataCorp, College Station, TX). This software was used because it can account for the complex sample design of the NCS-R (i.e., account for factor design effects in its variance estimates) by applying the Taylor series linearization method to the stratification and weighting information available in the NCS-R data set. A critical p -value of .05 (two-tailed) was used in all analyses. Each confidence interval (CI) reported is a 95% CI.

Results

Descriptive statistics regarding the attachment ratings are provided in Table 1. Secure attachment ratings were negatively associated with avoidant ($r = -.29, p < .001$) and anxious ($r = -.08, p < .001$) attachment ratings, and the two insecure ratings were positively associated with each other ($r = .34, p < .001$).

The prevalence rates of the sleep disturbances are also reported in Table 1. They were all relatively common (i.e., the prevalence rates ranged from 16.22% to 19.88%) and were all positively associated with each other (in all cases $p < .001$). Difficulty initiating sleep had relatively large associations with difficulty maintaining sleep ($r_{phi} = .51$) and early morning awakenings ($r_{phi} = .41$), and had a relatively weaker association with daytime sleepiness ($r_{phi} = .23$). Difficulty maintaining sleep was associated with early morning awakenings ($r_{phi} = .59$) and daytime sleepiness ($r_{phi} = .29$). Finally, early morning awakenings was associated with daytime sleepiness ($r_{phi} = .30$). The r -squared values indicate that the shared variance between the sleep disturbance variables ranged from 5.3% to 34.8%.

The avoidant and anxious attachment ratings were both positively associated with the health condition variable [respectively, odds ratios of 1.14 ($p = .004$) and 1.29 ($p = .001$)]; whereas the secure attachment ratings were not significantly associated with this variable (odds ratio .98, $p = .66$). Avoidant attachment ratings were positively associated with all the psychiatric disorder variables (odds ratios ranged from a low of 1.70 for alcohol/substance use disorders to 2.10 for bipolar disorder, $p < .001$ in both cases) as were the anxious attachment ratings (odds ratios ranged from a low of 1.79 for anxiety disorders to 2.26 for bipolar disorders, $p < .001$ in both cases). Secure attachment ratings were negatively associated with all the psychiatric disorder variables. The strongest of these associations was with anxiety disorders (odds ratio = $-.76, p < .001$) and the weakest was with bipolar disorders (odds ratios = $-.72, p < .001$).

Logistic regression analyses were used to determine whether the attachment ratings were associated with each sleep disturbance. The first set of analyses investigated bivariate associations between each attachment rating and each sleep disturbance. The odds ratios from these analyses are presented in Table 2. Secure attachment had significant negative associations with all four sleep disturbances. Both insecure attachment ratings (avoidant and anxious) had significant positive associations with all the sleep disturbances.

The second set of analyses adjusted for demographic variables (e.g., gender, marital status, race, age, and education level) and simultaneously entered the health condition variable, the five psychiatric disorder variables, and the three attachment style ratings. The odds ratios for the health condition, psychiatric disorders, and attachment variables are reported in Table 3. The standard errors for all of the predictor variables were small, indicating that multicollinearity was not an issue for any of the logistic regression models. Four trends emerged in the findings. First, the health condition variable had significant

Table 2

Associations (odds ratios and 95% confidence intervals) between attachment ratings and four forms of sleep disturbance.

Attachment variables	Sleep disturbances			
	Difficulty initiating sleep	Difficulty maintaining sleep	Early morning awakenings	Daytime sleepiness
Secure attachment ratings	0.77 (0.70–0.83)**	0.84 (0.79–0.89)**	0.83 (0.76–0.90)**	0.88 (0.80–0.97)*
Avoidant attachment ratings	1.58 (1.42–1.73)**	1.46 (1.35–1.58)**	1.50 (1.37–1.62)**	1.47 (1.37–1.56)**
Anxious attachment ratings	1.67 (1.48–1.88)**	1.54 (1.40–1.69)**	1.59 (1.43–1.77)**	1.51 (1.39–1.63)**

* $p < .01$ (two-tailed).** $p < .001$ (two-tailed).

positive associations with all of the sleep disturbances. Second, all of the psychiatric disorder variables were positively associated with the sleep disturbances, and a majority of these associations (85%) were statistically significant. Third, secure attachment was not significantly associated with any sleep disturbance. Fourth, the insecure attachment ratings consistently had significant positive associations with sleep disturbances. The association between anxious attachment and difficulty initiating sleep was not statistically significant and was the one exception to this trend.

Discussion

The present study investigated the hypothesis that attachment insecurity is positively associated with sleep disturbances. The NCS-R provided a rare opportunity to address two limitation of past research in this area (viz., generalizability and potential confounds) because it utilized a large sample representative of the general U.S. civilian population and included variables regarding physical health conditions as well as a comprehensive diagnostic interview for psychiatric disorders.

The initial bivariate analyses all supported the hypothesis that attachment insecurity is positively associated with sleep disturbances. Multiple logistic regression analyses, adjusting for sociodemographic variables, were used to investigate associations between attachment styles and sleep disturbances while addressing health conditions and psychiatric disorders as a potential confounds. Consistent with previous research [4], these analyses provided further evidence that physical health conditions and psychiatric disorders are positively associated with sleep disturbances. It is important to note that sleep disturbances are included in the diagnostic criteria for several psychiatric disorders (viz., major depressive disorder, dysthymia, and generalized anxiety disorder) and a decreased need for sleep is a criterion for the bipolar disorders. However, it is implausible that this inclusion of sleep-related symptoms in the diagnostic criteria would have been solely responsible for the associations between psychiatric disorders and sleep disturbances. As well, it is noteworthy that several forms of psychopathology that do not include sleep disturbances as a criterion (viz., alcohol/substance disorders and attention deficit disorder) also had significant positive associations with some of the sleep disturbances variables.

The finding that physical health conditions and numerous forms of psychopathology were related to sleep disturbances highlights the importance of statistically adjusting for such conditions when investigating the connection between attachment and sleep. Given that previous studies have not adjusted for physical health conditions and only a few have considered depressive symptoms [26,29,31], the current study provided the most stringent, or conservative, investigation of the associations between adult attachment characteristics and sleep disturbances. Avoidant attachment had significant positive associations with all the sleep disturbances. With the exception of difficulty initiating sleep, anxious attachment also had significant positive associations with all the sleep disturbances. Secure attachment did not have any significant associations with the sleep variables in the multivariate analyses. Thus, this comprehensive and rigorous approach produced findings largely consistent with the hypothesis that attachment insecurity is positively associated with sleep disturbances.

Previous research generally suggests that both forms of attachment insecurity are associated with sleep problems. The current findings add further support for the view that avoidant and anxious attachment could both be predisposing factors for sleep disturbances. Attachment insecurity is thought to develop as a result of difficult relationships during childhood and is characterized by difficulties in current relationships [10]. This tendency to experience relationship problems is a key feature of both these forms of attachment insecurity and may be one of the characteristics of attachment insecurity that is most responsible for the associations found in the present study. This explanation for the connection between attachment insecurity and sleep is particularly promising as relationship difficulties are associated with both forms of attachment insecurity [41,42] and with sleep problems [43]. Anxiously attached individuals are prone to experiencing a sense of vulnerability in relationships [44]. These perceptions of relationship threat may be important contributors to anxiously attached individuals' sleep disturbances. Individuals with avoidant attachment are thought to have a history of unmet attachment needs and to cope with these unmet needs by suppressing negative emotions and downplaying the importance of their close relationships [44]. In the face of relatively minor

Table 3

Summary of multiple logistic regression models predicting sleep disturbances.

Predictor variables	Sleep disturbances			
	Difficulty initiating sleep	Difficulty maintaining sleep	Early morning awakenings	Daytime sleepiness
Health condition (1 or more)	2.38 (1.76–3.22)***	2.38 (1.89–2.99)***	2.08 (1.62–2.67)***	2.58 (1.89–3.52)***
Depressive disorders	2.01 (1.60–2.52)***	2.27 (1.82–2.84)***	1.74 (1.45–2.09)***	1.69 (1.31–2.17)***
Bipolar disorders	1.75 (1.19–2.57)**	1.84 (1.29–2.62)***	1.68 (1.27–2.23)***	1.40 (.97–2.00)
Anxiety disorders	1.89 (1.58–2.27)***	2.18 (1.76–2.69)***	2.19 (1.82–2.64)***	2.05 (1.64–2.56)***
Alcohol/substance use disorders	1.94 (1.58–2.37)***	1.42 (1.12–1.80)**	1.11 (.87–1.41)	1.18 (.88–1.58)
Attention deficit disorder	1.57 (1.12–2.20)**	1.56 (1.04–2.33)*	2.25 (1.57–3.22)***	1.61 (1.01–2.57)*
Secure attachment ratings	.92 (.84–1.02)	.96 (.89–1.02)	.97 (.88–1.06)	1.02 (.91–1.13)
Avoidant attachment ratings	1.22 (1.10–1.35)***	1.19 (1.10–1.30)***	1.21 (1.12–1.32)***	1.24 (1.15–1.34)***
Anxious attachment ratings	1.13 (.98–1.30)	1.16 (1.02–1.31)*	1.17 (1.04–1.31)**	1.14 (1.03–1.27)*
Adjusted Wald F-values	15.69***	44.90***	33.15***	18.10***

Note: Odds ratios (OR) are from models that included all of the predictor variables listed above and adjusted for gender, marital status, education level, race, and age; 95% confidence intervals are included in parentheses.

* $p < .05$ (two-tailed).** $p < .01$ (two-tailed).*** $p < .001$ (two-tailed).

relationship distress, they may be successful in minimizing their distress and as a result their sleep may not be negatively impacted. However, those with avoidant attachment are not always successful in using their suppressive form of coping [45] and do experience increased arousal in response to conflict [46], so they may experience sleep disturbances in response to more severe relationship conflicts that they are unable to minimize. Alternatively, those with insecure attachment could also be more likely to experience sleep disturbances due to an absence of pre-sleep interpersonal interactions that foster a sense of security (e.g., supportive and empathic conversations) and that may also promote sleep. Individuals with anxious attachment would be expected to desire such interactions, but have difficulty initiating them. Individuals with avoidant attachment would be expected to see little value in such interactions and to avoid them. To date, research on adult attachment and sleep has not investigated these possibilities and with few exceptions [26,27] has ignored the social context of sleep and the role of interpersonal factors.

As noted above, avoidant and anxious attachment are associated with different capacities and approaches to affect regulation [44]. This raises the possibility that processes unique to each of them are responsible for their associations with sleep disturbances. There is a large body of research suggesting that hyperarousal plays an important role in the development of sleep disturbances [47,48]. Attachment anxiety is associated with stronger physiological reactivity to stress [49,50], so this characteristic of anxiously attached individuals may play an important role in their proneness to experience sleep difficulties. In contrast, individuals with avoidant attachment may be prone to developing sleep difficulties because they are more likely to use some forms of avoidant coping that have a detrimental effect on sleep, such as napping to avoid negative affect.

As noted earlier, the current study had important methodological strengths relative to past studies of adult attachment characteristics and self-reports of sleep. However, several limitations should be noted. First, it was cross-sectional, so the associations observed could reflect a variety of relationships between attachment and sleep. Based on theoretical considerations and past research suggesting attachment insecurity is a risk factor for other negative outcomes [51,52], the present study was based on the premise that the findings reflect processes in which attachment insecurity leads to the development and/or maintenance of sleep disturbances. However, it remains possible that the associations found could instead reflect a negative influence of sleep problems on attachment security. Second, the sleep variables included only self-reports of four forms of sleep disturbance and did not include subjective reports of the overall severity of sleep disturbances or objective indicators of sleep impairment (e.g., polysomnography). Arguably, the major limitation of the study was that it relied on a secondary analysis of an existing data set and, as a result, attachment was assessed with an older measure that is less psychometrically sophisticated than those often used in previous research on attachment and sleep. The current study utilized continuous ratings of three attachment styles. In contrast, many previous studies have used self-reports of two attachment dimensions. In this approach, attachment anxiety (i.e., fears of rejection based on beliefs of personal unworthiness) and attachment avoidance (i.e., mistrust and avoidance of close relationships) are individual difference variables reflecting particular forms of insecurity, while secure attachment is defined as the combination of low anxiety and avoidance [53]. Given inconsistencies in the assessment of attachment, the current findings cannot be directly compared with those of previous studies utilizing self-reports of attachment anxiety and avoidance. Nonetheless, the current findings are clearly consistent with the majority of past studies that have found one or more forms of attachment insecurity to be associated with self-reports of sleep problems [24–26,28,29,32].

Notwithstanding the limitations noted above, the present findings provide compelling evidence that attachment insecurity is associated with self-reports of sleep disturbances. Research elucidating the

mechanisms responsible for these associations is warranted. The findings of such research could be used to refine current practices regarding the treatment and management of sleep disturbances by identifying the components of current behavioral interventions that are most relevant to those with particular forms of attachment insecurity. For example, based on the suggestions above, those high in attachment anxiety may be particularly responsive to techniques that reduce physiological arousal (e.g., progressive muscle relaxation). Given that attachment insecurity is largely characterized by difficulties with relationships, treatments offered to those with insecure attachment might also be enhanced by attending to their interpersonal concerns and behaviors that interfere with sleep. Additional research focused on sleep-related interpersonal experiences would be required to guide such treatment innovations.

Conflict of interest

The authors have no competing interest to report.

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